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ABSTRACT

This paper, presented ~~at~~ the 1979 meeting of the American Educational Research Association, investigates the impact of programs for the mathematically gifted upon the course-taking and attitudes of gifted girls. The study is based on The Study of Mathematically Precocious Youth (SMPY) of the Johns Hopkins University, initiated in 1971 to identify youths at grades seven and eight who exhibit superior mathematical reasoning ability. Data for this study were collected from the following groups at the end of the 1977-78 school year: (1) girls who participated in an all-girl accelerated class at Hopkins and an all-girl career class at Hopkins; (2) boys and girls who participated in an accelerated class in their own school systems in Maryland, Minnesota, and Illinois; and (3) two control groups of boys and girls from the Talent Searches who had not participated in a special program. Five hypotheses with respect to acceleration were tested. Implications for counseling and career education are also discussed. (HM)

AERA San Francisco Meeting, April 8-12, 1979

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Sex Differences in Attitudes and Course-Taking Among the Gifted: Implications for Counseling and Career Education[1]

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Intellectually Gifted Child Study Group
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The Study of Mathematically Precocious Youth (SMPY) at The Johns Hopkins University was initiated in 1971 to identify youths at grades seven and eight who exhibit superior mathematical reasoning ability, and to devise ways to help them develop their talent. Over 10,000 students have participated in one of six Talent Searches in which they were given the Scholastic Aptitude Test-Mathematics (SAT-M) (Stanley, Keating & Fox 1974; Keating, 1976; Stanley, 1977).

Each year, the mean score difference between boys and girls has been at least 35 points and about a fourth of the boys, but only an eighth of the girls, score over 500 on the SAT-M. This difference in performance can not be attributed to differential course taking in school.

Girls who participate in the talent searches differ from the boys with respect to career interests, values, eagerness to accelerate their learning of mathematics, and later course-taking. Questionnaire responses indicated that these students do not differ significantly with respect to reported liking of mathematics, but girls are less likely than boys to agree that the study of mathematics will be important for their future careers. The majority of boys who participate in the talent searches have career interests of an investigative nature as classified by the Holland Vocational types. Girls, on the other hand, show an interest in Social and Artistic careers. Girls in the talent searches do exhibit more interest in careers of an investigative nature than adolescent girls in general, but less

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[1] Based on L. H. Fox, L. E. Brody, and D. H. Tobin, Women and mathematics: The impact of early intervention programs upon course-taking and attitudes in high school. First annual report to the National Institute of Education on its two-year grant, No. NIE-G-77-0062 to the Intellectually Gifted Child Study Group, 1978.

interest than their gifted male cohorts (Fox & Denham, 1974; Fox, Pasternak & Peiser, 1976). It seems likely that these differential career interests of gifted boys and girls are a factor in later differences in course-taking. One follow-up study of high school graduates who had participated in a Talent Search as seventh or eighth graders (309 boys and 218 girls) found two-thirds of the boys, but only slightly less than a third of the girls had taken Calculus in high school (Benbow, 1979).

SMPY and the Intellectually Gifted Child Study Group (IGCSG) have conducted several experimental programs for these gifted students over the past several years, Most of these programs have involved acceleration of learning of mathematics. These programs have been highly successful, especially for boys, and have been modified and adapted by school systems in Maryland, Minnesota, Illinois and are under consideration for adoption in several other states.

A grant from the National Institute of Education (NIE) to the IGCSG has made it possible to undertake a study of the impact of programs for the mathematically gifted upon the course-taking and attitudes of gifted girls. Data have been collected from girls who participated in an all-girl accelerated class at Hopkins and an all-girl career class at Hopkins. Data are also being collected for boys and girls who participated in an accelerated class in their own school systems in Maryland, Minnesota and Illinois. Finally, two control groups of boys and girls from the Talent Searches who have not participated in a special program, have been studied. Data collected on course-taking and attitudes in the first year of this study are presented in the following sections.

Analysis of Course-Taking

Course-taking data were collected from three of the four school systems included in this study at the end of the 1977-78 school year. This included information on how many students had enrolled in the special mathematics classes, how many had dropped out, the scores the students received on any tests that were used for selection into the program, and scores on standardized achievement tests that were used to measure achievement in the program. The fourth school system has not yet officially responded with data, but a limited amount has been received informally, and additional course-taking data are expected soon.

Course-taking data on the Hopkins all-girls accelerated class and the control groups of boys and girls that were identified in 1973 were received via questionnaires and phone calls. The subjects were asked about current and future mathematics course-taking and, in some of the follow-ups, for their grades in these courses. Achievement test scores could not be obtained for these groups.

Course-taking data are being collected for the girls in the Career Awareness class this year. It was decided that a greater response would be more likely if the girls were polled only once during the study and it was desirable to do it during the second year so that the girls would be older and more information obtained.

Since this study is aimed at identifying ways to encourage mathematically able girls to take more mathematics courses, it seems valuable to identify programs that result in acceleration in mathematics. Presumably the girls who have successfully completed more difficult mathematics courses before the time when girls traditionally begin to

drop out of mathematics in high school will be less likely to stop taking mathematics courses and, even if they should drop out of mathematics courses after tenth or eleventh grade, they may have completed Calculus by that time. Bright students in most school systems normally begin Algebra I in eighth grade. Thus, students who complete Algebra I, Algebra II and Plane Geometry by the end of ninth grade can be considered to be at least one year accelerated in mathematics. If these accelerated students continue to take a pre-Calculus course in tenth grade and Calculus in eleventh grade, they remain at least one year accelerated.

Table 1 shows the number and percent of students in the various groups

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Insert Table 1

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who had completed Algebra I, Algebra II and Geometry by the end of ninth grade. The figures for the Hopkins all-girls class and the control groups are based on actual courses taken. The school-based populations include projections since some of the students were not yet ninth graders. Any student in an accelerated program who had completed any two of the three courses Algebra I, II and Geometry by the end of either seventh or eighth grade was projected to easily be able to take the third course in ninth grade in a regular high school even if he/she dropped out of the accelerated program.

Five hypotheses with respect to acceleration are shown in Table 2 and the accompanying key. Omitted were tests involving the Career Awareness class for which data were not yet available. The school

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Insert Table 2

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system-based groups were not subdivided based on age but were treated as one group and evaluated at the end of ninth grade only. Comparisons of these students at the end of tenth and eleventh grade will be made when course-taking data for the 1978-79 school year are received.

Hypothesis I was that gifted boys and girls differ with respect to mathematics courses taken in high school. To test this hypothesis, the two control groups were compared to see if there was a significant difference in the number of boys and girls who had accelerated their mathematics course-taking without being part of an accelerated program. There were no significant differences at the end of ninth or tenth grade but there was a significant difference ($p<.05$) in the numbers of boys vs. girls who took Calculus in eleventh grade.

The second hypothesis stated that girls who participate in an accelerated mathematics program will differ from girls who were not in a special program with respect to mathematics courses taken in high school. A comparison between the girls in the Hopkins all-girls accelerated class and the control girls who were not in an accelerated program revealed significant differences at the end of ninth and tenth grade ($p<.01$) in the number accelerated in mathematics but no significant difference in the number of girls who took Calculus in eleventh grade. This was largely due to the fact that six girls from the accelerated class who had completed all their pre-Calculus requirements by the end of tenth grade took College Algebra instead of Calculus in eleventh. A comparison between the school-system based accelerated girls and the control girls at the end of ninth grade revealed significant differences ($p<.001$) in the number who had completed Algebra I, II and Plane Geometry.

The third hypothesis was that girls who participated in an accelerated mathematics program will differ from boys who were not in an accelerated program with respect to course taking in high school. A comparison between the girls in the Hopkins all-girls accelerated class and the control boys revealed a significant difference ($p<.05$) at the end of ninth grade in the number accelerated in mathematics but by the end of tenth grade there was no longer a significant difference and by the end of eleventh grade, while the difference was not statistically significant, more boys than accelerated girls had taken Calculus. A number of boys had managed to accelerate themselves in mathematics without being in a special program and, as was mentioned earlier, the girls seemed reluctant to take Calculus and chose College Algebra instead. A comparison between girls in the school based-accelerated programs and the control boys revealed significant differences ($p<.001$) in the numbers who had completed Algebra I, II and Geometry by the end of ninth grade.

The fourth hypothesis was that girls and boys who participate in accelerated mathematics classes will not differ with respect to mathematics courses taken in high school. A comparison of boys vs. girls from the school-based accelerated programs at the end of ninth grade revealed no significant difference and thus the hypothesis was supported at that grade level.

The final hypothesis for which analysis was done was that girls who participated in a school system based accelerated program will differ from girls who participated in a special summer accelerated program with respect to course-taking in high school. A significant difference ($p<.01$) was found when the course-taking at the end of ninth grade of

the girls from the Hopkins accelerated class was compared with that of the girls in the school-based programs. Generally the school based classes allowed for a greater rate of acceleration than the Hopkins class did, and the schools had a tendency to be more cooperative about arranging appropriate mathematics for the students coming out of their own programs than for the girls coming from Hopkins.

These results suggest that either eleventh grade, or the year the student is ready to take Calculus, (if these do not occur simultaneously, it is not clear which is the more relevant factor since the variable investigated in this study was Calculus in the eleventh grade), may be the most critical time for sex differences in mathematics course-taking to become evident. Significant differences in the mathematics course-taking of boys and girls who were not in special programs did not appear until eleventh grade when more boys than girls took Calculus. At the same time, significant mathematics course-taking differences between the girls in the Hopkins accelerated class and the control boys that were present in ninth and tenth grades, and that favored the accelerated girls, disappeared in eleventh grade because the girls were reluctant to take Calculus.

Analysis of the students in the school-based programs has so far only been conducted through ninth grade. It will be important to note what happens when these students reach 11th grade and/or Calculus. It would also be useful to find out if the six accelerated girls who were reluctant to take Calculus in eleventh grade did or did not take it in twelfth grade. An attempt will be made to address these issues in the second year of this study.

Attitudes

Although course-taking behavior is the primary dependent variable to be studied in this project, it seemed desirable to attempt to assess the affective impact of special programs. After reviewing several measures, the decision was made to use the Fennema-Sherman Mathematics Attitude Scale (F-S MAS) as the attitude measure for this project.

The F-S MAS consists of 96 Likert type items which form eight scales of 12 items each, six positive statements and six negative statements. Each response is given a score from 1 - 5, such that a five is given to the response that is hypothesized to have a positive effect on learning mathematics. Thus, strong agreement with positively worded item and strong disagreement with a negatively worded item would both be scored as a 5. In the Mathematics as a Male Domain scale, the response indicating the least stereotyping of mathematics as masculine will receive a score of five.

Since the students in the study are younger than the students in the Wisconsin sample and are mathematically talented, it seemed desirable to obtain some base rate measure of the F-S MAS for mathematically able adolescents. Thus, the F-S MAS was given to students from the ~~1977~~ 1978 SMPY Talent Search.

Previous research on sex differences among mathematically gifted seventh graders had not found sex differences in attitudes towards mathematics as measured by questionnaire responses to items about liking for mathematics but had revealed sex differences in perceived usefulness of mathematics for future goals, and self-confidence as measured by prediction of success in the talent search. The attempts to assess

attitudes had been fairly crude and it was hoped that the F-S MAS would be a more sensitive measure.

The F-S MAS was mailed to 367 high scorers in the ~~1977~~ 1978 Talent Search conducted at the Johns Hopkins University by The Study of Mathematically Precocious Youth (SMPY); 337 responded (189 boys and 148 girls), a response rate of 91.8 percent. The students were seventh graders who had voluntarily participated in a mathematics contest, scored well and thus were presumed to have favorable attitudes towards mathematics. The percentile rate on the F-S MAS norms of the mean scale scores for boys and girls in the Talent Search are shown in Table 3.

Insert Table 3

When compared with the high school population of Wisconsin, the gifted students do indeed have favorable attitudes. This is particularly striking on the two scales which deal with self-confidence as a learner of mathematics and persistance and enjoyment of mathematics (the effectance motivation). This result is gratifying as it is consistent with the logic that gifted students who elect to participate in a talent search should perceive themselves as competent in mathematics more than would students in general as represented by the Wisconsin norms. The students in the talent search differed least from the Wisconsin group on the Math as a Male Domain Scale.

The mean scale scores and variances for each scale, by sex, are shown in Table 4.

Insert Table 4

T-tests for independent samples were significant for two of the eight scale comparisons. The Confidence as a Learner of Mathematics Scale differed significantly in favor of the boys, as would be consistent with informal observation and results of a previous study of expectancy for success in the talent search.

The distribution of item responses to the Confidence Scale is shown in Table 5. With the exception of items four and six, 95 percent

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Insert Table 5

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of the boys agreed with the positive items (1-6) and disagreed or strongly disagreed with the negative items (7-12). With the exception of items four and six, at least 85 percent of the girls agreed or strongly agreed with the positive items and disagreed or strongly disagreed with the negative items. In some cases the differences between the boys and girls was a matter of degree of positiveness, as in item seven.

When one looks at the content of the items, the response patterns make sense in relation to previous research findings on women and mathematics. The item to which the largest percentage of girls responded "strongly agree" was Item 5, "I can get good grades in mathematics." The positive items to which the largest percentage of girls responded "disagree" or "undecided", were Items 6, 4, and 2, respectively:

"I have a lot of self-confidence when it comes to math",
"I think I could handle more difficult mathematics", and
"I am sure I could do advanced work in mathematics."

The negative items for which the largest percentage of girls were undecided or agreed, were 12, 11, and 9, respectively:

"Math has been my worst subject",

"Most subjects I can handle, but I have a knack for flubbin up math", and

"I'm not the type to do well in math."

Thus, some girls know they make good grades but still persist in projecting future failures or a denial of their ability - even though this is a sample of girls who are among the most mathematically talented girls in the nation (at least the top 2 percent on in-grade tests such as the Iowa Tests of Basic Skills).

Of course, some of the highly able boys responded similarly to these items, but the difference still seems to be meaningful in practical terms. Twice the percentage of girls than boys were uncertain or negative about their ability to handle more difficult math, and well over twice the percentage of girls than boys admitted to lacking confidence when it comes to mathematics.

The second scale for which a significant difference was found was the Mathematics as a Male Domain Scale In this case, girls had more positive scores than the boys, (i.e., were less likely to agree that mathematics was a male domain than were the boys). Boys in the Talent Search, however, had considerably higher scores than the normative sample from Wisconsin.

The distribution of the actual responses to the Math as a Male Domain items are shown, by sex, in Table 6. On these items the pattern

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Insert Table 6

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is almost the reverse of the one for Confidence. It is girls, not boys, who tend to check "strongly agree" to the positive items and "strongly disagree" to the negative ones. On four of these items (which reflect stereotyped thinking of mathematics as a male domain), as many as a fifth to a third of the boys were undecided or accepted the stereotypic image. For example, on item one, "Females are as good as males in geometry", approximately 92 percent of the girls agreed, but a third of the boys were undecided or disagreed. Item 2, "Studying mathematics is just as appropriate for women as for men" was strongly endorsed by 86.5 percent of the females, but by less than half of the males. Almost twenty percent of the boys, but very few girls, were undecided or negative in response to "I would trust a woman just as much as I would trust a man to do an important calculation." On only one item, number 7, did more than half of the males respond with a strong response in support of female competence. That item was: "It's hard to believe a female could be a genius in mathematics."

The feeling one might get from analyzing the responses is that gifted boys believe a few atypical females can achieve in mathematics, but many are not at all confident that women in general are equal to men with respect to mathematics. The stereotype of the "atypical female" as good at mathematics is further supported by the responses to item 5 of the Male Domain scale. Item 5 reads: "Males are not naturally better than females in mathematics." Over 20 percent of the boys disagreed with this statement and 19 percent were undecided. Less than a third disagreed strongly with the stereotype. (Even 17 percent of the girls disagreed with the idea of sexual equality in mathematics.)

Gifted and talented adolescent females have the same problems of all adolescent females with respect to developing their self-image of femininity. With respect to mathematics and femininity, two items point out the possible conflict between gifted girls and boys. On item 8, "When a woman has to solve a math problem, it is feminine to ask a man for help", less than 10 percent of the girls were undecided or agreed, while more than 36 percent of the boys were undecided or agreed. Over 14 percent of the boys were also undecided about the question of female mathematicians being masculine (#12). Only 41 percent strongly disagreed.

In light of previous research it is interesting and somewhat surprising that the scale scores for Perceived Usefulness of mathematics were not significantly different for the girls and boys. One explanation is that previous research found differences in course-taking or proposed course-taking and in interviews or questionnaires found the reason given for not taking advanced courses was, in many cases, the perceived usefulness of the courses for the individual's personal career plans. In the F-S MAS, the items dealing with future course-taking are in the Self-confidence scale, whereas the Usefulness scale items are more general in terms of usage of words such as mathematics and future work. Items do not ask about the usefulness of <u>advanced</u> courses such as calculus for future work. Perhaps the F-S MAS could be improved by rewording the Usefulness scale to use terms such as <u>calculus</u> in place of <u>mathematics</u>.

Implications for Counseling and Career Education

The second year of the study will hopefully provide much more information as to counseling and career education needs. Preliminary results suggest that gifted girls have less self-confidence than boys with respect to mathematics. stereotype mathematics as masculine less than the boys do but may still have difficulty in accepting their own ability in mathematics. (As one girl put it: in my school boys and girls who are good at math are treated just the same - they are both ridiculed and called "brains".) Girls who participate in an accelerated program for the gifted appear to benefit from the experience initially but may still be resistant to studying calculus, perhaps because they do not see it as relevant to their career goals.

The initial results of the F-S MAS with gifted populations were disappointing in terms of its potential as a post-treatment measure of attitude since the base rate responses of gifted girls who had not had treatment were near the ceiling in a positive direction for most scales. A questionnaire was subsequently designed and has been sent to school systems and career class populations in the course-taking samples as well as to an untreated control group of gifted boys and girls.

The questionnaire focuses on the following three broad areas: Math and Science course-taking plans and factors influencing their decisions to study math; career plans and factors associated with their choices; and feelings about the value or influence of the program in which they participated.

Preliminary analysis of questionnaires received to date suggest the following hypothesis or questions:

1. Gifted girls will be likely to say they will "probably" study Calculus and physics whereas boys will be likely to say they will "definitely" take the courses.
2. Gifted girls will anticipate a full- or part-time career for themselves for most of their adult life, whereas many boys will expect their wives will not work after they have children.
3. Gifted girls who are the most accelerated in their course-taking will be likely to have the most "liberated" view of their future career plans and investigative career interests.
4. Gifted girls' decisions to drop out of a mathematics program for the gifted will be influenced by social factors such as the number of girls in the class rather than the difficulty of the program.
5. Gifted girls who accelerate themselves in mathematics and who have studied or definitely plan to study Calculus will report the early influence of parents, especially fathers, upon the development of their interest in mathematics.
6. Gifted girls who participated in a career class will be oriented towards careers in mathematics more than girls who participated in an accelerated class.

In conclusion, it appears that ability is not enough to ensure the study of mathematics at the higher levels (such as Calculus in high school) nor interest and pursuit of a scientific or mathematical career among gifted young women. Counseling and career education may be the crucial components of a program for the mathematically able, especially the girls.

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Table 1: Number and Percent of students completing Algebra I, II and Geometry by or before the end of 9th grade and are at least one year accelerated in mathematics

Group	N	# Accelerated	# Non-accelerated	% Accelerated
Hopkins all-girl accelerated class	26	12	14	46
School system based accelerated classes-Boys	126***	108**	18	86
School system based accelerated classes-Girls	56***	43**	13	77
Career Awareness class for girls	24	*	*	*
Control Girls	25	3	22	12
Control Boys	26	5	21	19

* data not available at this time

** These figures include all students who completed at least two years of the Algebra I, Algebra II, Geometry sequence by the end of either 7th or 8th grade. It was projected that they could easily complete the third course by the end of 9th grade in their regular school even if they dropped out of the program.

*** Students who entered an accelerated program as 9th graders were not included in this total unless the accelerated program was designed to allow them to complete Algebra I, Algebra II and Geometry in the one year.

Table 2: Results of Chi Square Tests of Hypotheses relative to the impact of different treatments upon mathematics course-taking

Hypothesis	Group[1]	Variable[1]	X^2	Level of Significance
I. Boys and girls differ with respect to mathematics courses taken in high school	V vs. VI	A	.5	n.s.
		B	3.6	n.s.
		C	4.7	$p < .05$
II. Girls who participate in an accelerated mathematics program will differ from girls who were not in a special program with respect to mathematics courses taken in high school	II vs. V	A	7.9	$p < .01$
		B	8.4	$p < .01$
		C	1.1	n.s.
	III vs. V	A	29.6	$p < .001$
III. Girls who participated in an accelerated mathematics program will differ from boys who were not in an accelerated program with respect to course-taking in high school	II vs. VI	A	4.3	$p < .05$
		B	1.3	n.s.
		C	1.6[2]	n.s.
	III vs. VI	A	24.2	$p < .001$
IV. Girls and boys who participate in accelerated mathematics classes will not differ with respect to mathematics courses taken in high school	III vs. IV	A	2.2	n.s.
V. Girls who participated in a school system based accelerated program will differ from girls who participated in a special summer accelerated program with respect to course-taking in high school	II vs. III	A	7.5	$p < .01$

[1] The variables and groups are defined in the key on page of this report.

[2] This difference favors the boys rather than the girls. That is, at this grade level, there are more boys accelerated than girls.

KEY

Dependent Variables

A. Number and percentage of students completing Algebra I, Algebra II, and Plane Geometry by or before the end of the ninth grade (at least one year ahead of schedule)

B. Number and percentage of students completing all pre-requisite courses for the calculus by or before the end of the tenth grade.

C. Number and percentage of students who completed calculus by or before the end of the eleventh grade.

Groups

I. Girls in a career awareness program in the summer after seventh grade in 1977.

II. Girls in an accelerated mathematics class at The Johns Hopkins University in the summer after the seventh grade in 1973.

III. Girls in an accelerated mathematics program conducted by one of two different school systems in the years 1974-75, 1975-76, 1976-77 and 1977-78 when the girls were seventh graders

III_{G-1} The subset of the above who will have completed the tenth grade in 1979

III_{G-2} The subset of the above who will have completed the eleventh grade in 1979.

IV. The boys who participated in special accelerated mathematics classes in one of two school systems in the years 1974-75, 1975-76, 1976-77 and 1977-78 when the boys were seventh graders.

V. A group of girls who were not in an accelerated program who were seventh graders in 1973 and matched with Group II on measures of ability and socio-economic variables.

VI. A group of boys who were not in an accelerated mathematics program who were seventh graders in 1973 and matched with Groups II and V on measures of ability and socio-economic variables.

Table 3: Percentile Rank of Mean Scale Scores on the F-S MAS for the Talent Search Participants, by Sex

Scale	Percentile Rank	
	Girls	Boys
Confidence	90	91
Mother	88	86
Father	84	86
Success	81	78
Teacher	86	86
Male Domain	60	70
Usefulness	81	75
Effectance Motivation	91	91

Table 4: Mean Scores and Variances on the F-S MAS for the Talent Search Participants, by Sex

Scale	Girls $\bar{x}$	Girls s^2	Boys $\bar{x}$	Boys s^2	t
Confidence	53.16	41.42	55.70	18.26	4.34*
Mother	53.81	42.20	53.09	30.94	1.10
Father	54.15	39.50	54.60	25.24	.73
Success	52.93	33.31	51.68	38.69	1.89
Teacher	49.26	54.60	49.51	60.38	.30
Male Domain	55.98	20.62	49.66	51.80	9.33*
Usefulness	53.34	32.20	53.37	35.22	.05
Effectance Motivation	49.73	67.23	50.72	42.84	1.23

* $p < .001$

Table 5: Distribution of Item Responses to the Confidence Scale of the F-S MAS for Talent Search Participants, by Sex

Items	Sex	Strongly Disagree	Disagree	Un-decided	Agree	Strongly Agree
1. Generally I have felt secure about attempting mathematics.	Girls Boys	0.7 0.0	3.4 0.5	5.4 3.2	39.7 44.4	50.7 51.9
2. I am sure I could do advanced work in mathematics.	Girls Boys	0.0 0.0	2.7 1.1	9.5 3.2	36.5 35.5	51.4 60.3
3. I am sure that I can learn mathematics.	Girls Boys	0.0 0.5	0.7 0.0	5.4 1.6	25.0 16.4	68.9 81.5
4. I think I could handle more difficult mathematics.	Girls Boys	0.0 0.5	5.4 2.1	14.2 9.5	44.6 39.2	35.8 48.7
5. I can get good grades in mathematics.	Girls Boys	0.0 0.5	0.0 0.0	2.0 1.6	25.0 17.5	73.0 80.4
6. I have a lot of self-confidence when it comes to math.	Girls Boys	0.0 0.0	8.1 1.6	17.6 10.1	46.0 42.3	28.4 46.0
7. I'm no good in math.	Girls Boys	67.6 82.0	28.4 15.9	2.7 1.1	1.4 0.0	0.0 1.1
8. I don't think I could do advanced mathematics.	Girls Boys	59.5 73.0	32.4 24.3	6.8 1.1	1.4 1.1	0.0 0.5
9. I'm not the type to do well in math.	Girls Boys	58.9 69.3	30.4 29.1	7.4 1.6	2.0 0.0	1.4 0.0
10. For some reason, even though I study, math seems unusually hard for me.	Girls Boys	60.1 74.1	31.1 22.8	2.7 2.1	4.1 1.1	2.0 0.0
11. Most subjects I can handle O.K., but I have a knack for flubbing up math.	Girls Boys	68.9 81.0	19.6 17.5	6.1 1.1	4.7 0.0	0.7 0.5
12. Math has been my worst subject.	Girls Boys	75.0 86.2	12.8 12.7	5.4 0.5	5.4 0.0	1.4 0.5

Table 6: Distribution of Item Response to the Mathematics as a Male Domain Scale of the F-S MAS for Talent Search Participants, by Sex

Items	Sex	Strongly Disagree	Disagree	Un-decided	Agree	Strongly Agree
1. Females are as good as males in geometry.	Girls	0.0	1.4	6.8	24.3	67.6
	Boys	1.6	3.7	28.6	34.9	31.2
2. Studying mathematics is just as appropriate for women as for men.	Girls	0.7	0.0	0.7	12.2	86.5
	Boys	0.5	2.1	9.0	41.8	46.6
3. I would trust a woman just as much as I would trust a man to figure out important calculations.	Girls	0.0	0.7	1.4	16.2	81.8
	Boys	0.5	4.2	14.8	40.7	39.7
4. Girls can do just as well as boys in mathematics.	Girls	0.7	0.7	1.4	17.6	79.8
	Boys	0.0	3.7	11.6	42.3	42.3
5. Males are not naturally better than females in mathematics.	Girls	11.5	5.4	6.1	14.2	62.8
	Boys	5.8	15.9	19.1	27.5	31.8
6. Women certainly are logical enough to do well in mathematics.	Girls	0.7	0.0	0.7	16.2	82.4
	Boys	0.5	2.1	10.6	42.3	44.4
7. It's hard to believe a female could be a genius in mathematics.	Girls	86.5	8.1	0.7	1.4	3.4
	Boys	56.1	29.1	11.1	1.6	2.1
8. When a woman has to solve a math problem, it is feminine to ask a man for help.	Girls	70.1	19.6	4.7	2.7	2.0
	Boys	36.5	27.0	29.1	5.3	2.1
9. I would have more faith in the answer for a math problem solved by a man than a woman.	Girls	77.0	15.5	5.4	0.7	1.4
	Boys	45.5	25.4	22.2	5.3	1.6
10. Girls who enjoy studying math are a bit peculiar.	Girls	81.1	16.2	1.4	0.7	0.7
	Boys	54.0	31.2	10.6	2.7	1.6
11. Mathematics is for men; arithmetic is for women.	Girls	87.2	6.1	4.1	0.0	2.7
	Boys	47.6	29.6	22.2	0.5	0.0
12. I would expect a woman mathematician to be a masculine type of person.	Girls	72.3	22.3	4.7	0.0	0.7
	Boys	40.7	42.9	14.8	1.1	0.5